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NEW SERIES.—No. LVII.

M. L. FERNALD.

I. THE UNITY OF THE GENUS *ARENARIA*.

It seems wisest to maintain the genus *Arenaria* in its broad sense, although the great majority of European authors and some in America distinguish from *Arenaria* proper (with the valves of the capsule notched or cleft at apex, and seeds numerous and reniform) the following genera which occur in boreal America: *Alsine* Wahlenb. or *Minuartia* L. similar to *Arenaria* but with uncleft valves; *Ammodenia* Gmel. or *Honkenya* Ehrh., with unusually developed disk, globose capsule, and few obovoid seeds; *Moehringia* L., with well developed disk and with the seeds strophiolate; and *Merckia* Fisch., with 3-5 celled ovary and inflated capsule.

Although in a limited area, like Europe or like northeastern America, the lines usually indicated for the separation of these genera are fairly definite, an examination of species from a broad range of territory at once shows that no two of the traditional characters are concomitant throughout a long series of species.

In order to test the value of these genera it is well to tabulate the characters depended upon by those who maintain the segregated genera as distinct from *Arenaria*; and even in this it is difficult to find authors in entire agreement. Thus, some authors state that the seeds of the monotypic *Ammodenia* or *Honkenya* are "numerous," others "few," while Pax, in Engler's *Natürlichen Pflanzenfamilien*, retains under *Alsine* with "Discusschuppen meist kurz" *Ammodenia*

	Habit and foliage	Inflorescence	Disk	Ovary and capsule	Seeds
ARENARIA L.	Annual or perennial: mainly tufted: leaves not fleshy	Terminal, rarely axillary.	Perigynous or subhypogynous.	Ovary 1-celled, many-ovuled; capsule dehiscent at tip into 3 cleft or notched valves.	Numerous, reniform or compressed, with the hilum marginal, estrophiolate.
MINUARTIA L. = ALSINE Wahlenb., not L	As above.	As above.	Obscurely perigynous, more or less glandular-lobed.	As above, but valves of capsule entire.	As above.
AMMODENIA Gmel. = HONKENYA Ehrh.	Succulent perennial with fleshy leaves.	Flowers axillary or in leafy cymes.	Well developed, with 10 glandular lobes.	Ovary more or less completely 3- or 5-celled (1-celled according to Pax); capsule fleshy or bladdery, with 3 or 5 entire valves.	Few, pyriform or obovoid, with the hilum obliquely basal, estrophiolate.
MOEHRINGIA L.	Flaccid herbs with spreading usually flat leaves.	Terminal, often becoming lateral by prolongation of axillary branches, or axillary.	Well developed, nearly hypogynous.	Ovary 1-celled (but in <i>M. lateriflora</i> distinctly 2, 3, or 4-celled); valves of capsule twice as many as the style.	Seeds reniform, lustrous, estrophiolate.
MERCKIA Fischer	Similar to <i>Ammodenia</i> but less fleshy.	As <i>Ammodenia</i> .	Obscure or very narrow.	Ovary 3-5-celled; capsule bladdery, membranaceous.	Seeds lustrous, estrophiolate.

which is separated by others because it has "a conspicuous 10-lobed and glandular slightly perigynous disk." Again Pax defines *Alsine* (including *Ammodenia*) as having a 1-celled ovary, while *Merckia* is distinguished by its 3-5-celled ovary; yet Gray, in his *Genera*, described (correctly) the ovary of *Ammodenia* as 3-5-celled. The tabulation on the opposite page, however, presents the significant characters most relied upon in the separation of these five genera.

When these so-called differential characters are checked by examining species from remote areas of the world we get the following results.

Most species of *Arenaria* (in the strict sense) and of *Minuartia* have a tufted habit, with terminal inflorescences and numerous reniform seeds. But the common *A. lanuginosa* (Michx.) Rohrb. of South America, Mexico and the southern United States has elongated stems with broad leaves and axillary pedicels, thus in habit strongly simulating the European *Moehringia trinervia* (L.) Clairv. The latter plant, on account of its habit and its lustrous strophiole seeds, is unquestionably a species of *Moehringia*. Yet the seeds of *Arenaria lanuginosa*, a plant which in habit belongs to *Moehringia*, are quite like those of *M. trinervia* in form and lustre, but they lack the strophiole; i. e. only by its lack of a strophiole does *Arenaria lanuginosa* find a place in *Arenaria*, not in the habitally similar *Moehringia*.

Between *Arenaria* proper and *Minuartia* the only distinction is in the valves of the capsule, cleft in *Arenaria*, entire in *Minuartia*, the species of these so-called genera otherwise so closely simulating one another as to be often nearly inseparable. Thus, *Arenaria paludicola* Robinson, which has the entire valves of *Minuartia*, is habitally close to *A. lanuginosa*, a true *Arenaria*, and to species of *Moehringia*. Furthermore, it is by no means easy to determine whether some of our American species belong with *Arenaria* or with *Minuartia*, some species having the valves so slightly cleft that in their capsules they lie between the most characteristic species of the two groups. Thus *A. sajanensis* and the species related to it (and discussed below, pp. 12-17) have emarginate valves as does *A. laricifolia* of Europe, beautifully illustrated by Reichenbach (Ic. Fl. Germ. v. t. 292, fig. 4933) with notched valves, although these plants are universally placed in the so-called genus which is distinguished by having entire valves!

From all the segregate-genera *Ammodenia* is supposed to be separated by the highly developed glandular-lobed disk, by its bladderly capsule and by the few pyriform seeds with nearly basal hilum, and, of course, by its succulent stems. Yet Pax correctly states that *Merckia* has the habit of this plant, Pax separating *Merckia* because it has the ovary and fruit "mehr oder weniger vollkommen 3-5 fächerig" and because of its obsolete disk. *Ammodenia* is left by Pax in *Alsine* or *Minuartia*, a genus distinguished by 1-celled ovary and the entire valves of the capsule, and he states under *Merckia* that that monotypic genus perhaps belongs also with *Alsine*. Nevertheless, *Ammodenia*, as already pointed out by Asa Gray, has the ovary "more or less completely three-five-celled, the dissepiments soon breaking away from the walls and adhering to the more persistent columella;"¹ i. e., the supposed ovary-difference between *Ammodenia* and *Merckia* is not constant. Furthermore, the seed of *Merckia* is exactly intermediate in outline between the seed of *Ammodenia* and the most typical seeds of *Arenaria* and *Minuartia*, i. e., it is suborbicular to obovate-orbicular, with the hilum nearly basal. The development or obsolescence of the staminal disk is certainly not constant in the group, for, although *Merckia physodes* as a species is readily distinguished from *Ammodenia peploides* by its obscure disk, it should be noted that some species referred to true *Arenaria* and to *Minuartia* (*Alsine*) have highly developed disks, while the disk of *Moehringia* is well developed. The American *Arenaria macradenia* Wats., for example, is the best kind of *Arenaria* in its cespitose habit, acicular leaves, terminal inflorescence, capsule and seeds, but its staminal disk and glands are quite as conspicuous as in *Ammodenia*. *Ammodenia* is supposed to be distinguished from *Arenaria*, furthermore, by its few obovoid seeds in contrast with the many reniform seeds of the latter genus; yet *Arenaria Hookeri* Nutt., a characteristic cespitose species with acicular leaves and terminal cymes, has but 3 seeds to a capsule, these obovoid and with a basal hilum as in *Ammodenia*.

Moehringia is distinguished by its habit, well-developed disk, 1-celled ovary, capsule-valves as in *Arenaria*, and reniform, lustrous, strophiolate seeds. But as already pointed out *Moehringia* is exactly simulated by species of *Arenaria* which differ merely in having the

¹ Gray, Gen. ii. 31 (1849).

seeds estrophiolate, and it does not require great experience with the seeds of *Moehringia* to assure any investigator that the strophiole is readily deciduous and therefore likely not to be found at all on the ripe seeds. The American *Moehringia lateriflora* (L.) Fenzl is a member of this genus in habit, disk, and seeds, but unfortunately for the constancy of the genus, as long ago pointed out by Asa Gray, the ovary is "plainly divided in *M. lateriflora* into as many cells as there are styles by manifest dissepiments: STYLES 3....sometimes 2 or 4."¹ In other words, although a *Moehringia* in everything else, *M. lateriflora* is a *Merckia* in its 3-celled ovary!

It would be easy to point out in our North American flora many other species which in one character or another break down the differences which have been relied upon to separate as genera *Arenaria*, *Minuartia*, *Ammodenia*, *Moehringia* and *Merckia*, but the above notes should suffice to demonstrate that these are not true genera but are, rather, freely confluent subgenera of the single genus *Arenaria*.

In organizing the material of *Arenaria* in the Gray Herbarium it has been found necessary to make the following nomenclatorial changes.

ARENARIA arenarioides (Crantz), n. comb. *Stellaria Arenaria* L. Sp. Pl. 1196 (1753). *Cerastium arenarioides* Crantz, Inst. ii. 402 (1766). *Ar. cerastioides* Poir. Voy. Barb. ii. 166 (1789). *Ar. spathulata* Desf. Fl. Atlant. i. 358 (1798).

ARENARIA bryophylla, n. nom. *Ar. musciformis* Edgew. & Hook. f. in Hook. f. Fl. Brit. Ind. i. 237 (1872), not Triana & Planch. Ann. Sci. Nat. ser. 4, xvii. 150 (1862).

Edgeworth & Hooker ascribe their *A. musciformis* to Wallich, Cat. no. 6401 as does also *Index Kewensis*; but Wallich's no. 6401 is a *Buddleia* and at best the names in Wallich's Catalogue are *nomina nuda*.

ARENARIA Funkii (Jord.), n. comb. *Alsine Funkii* Jord. Pugill. 36 (1852).

ARENARIA cymifera (Rouy & Fouc.), n. comb. *Alsine cymifera* Rouy & Fouc. Fl. Fr. iii. 275 (1896).

ARENARIA iberica, n. nom. *Minuartia dichotoma* L. Sp. Pl. 89 (1753), not *Ar. dichotoma* Krock, Fl. Sil. ii. pt. 1, 55 (1793).

ARENARIA caucasica (Boiss.), n. comb. *Alsine caucasica* Boiss. Diagn. ser. 2, fasc. 1, 87 (1853), not *Ar. caucasica* Adams ex Ledeb.

¹ Gray, Gen. ii. 35 (1849).

Fl. Ross. i. 354 (1842), the latter merely a name published in synonymy. *Minuartia montana* L. Sp. Pl. 90 (1753), not *Ar. montana* L. Amoen. Acad. iv. 272 (1759). *M. campestris* DC. Prodr. iii. 380 (1828), not L. Sp. Pl. 89 (1753) nor *Ar. campestris* All. Fl. Ped. ii. 114 (1785).

ARENARIA **anatolica** (Boiss), n. comb. *Alsine anatolica* Boiss. Diagn. ser. 1, fasc. 8, 97 (1849).

ARENARIA **Thevenaei** (Reut.), n. comb. *Alsine Thevenaei* Reut. Exs. 1855 (name only); Loret, Bull. Soc. Bot. Fr. x. 381 (1863). *Al. verna*, var. *Thevenaei* Loret, l. c. (1863).

ARENARIA **attica** (Boiss. & Sprun.), n. comb. *Alsine attica* Boiss. & Sprun. Diagn. ser. 1, fasc. 5, 84 (1844).

ARENARIA **sphagnoides** (Froel.), n. comb. *Sabulina sphagnoides* Froel. in Reichenb. Fl. Germ. Exc. 790 (1832).

ARENARIA **aizoides** (Boiss.), n. comb. *Alsine aizoides* Boiss. Diagn. ser. 1, fasc. 1, 47 (1842).

ARENARIA **decipiens** (Fenzl), n. comb. *Alsine decipiens* Fenzl, Pugill. Pl. Nov. Syr. 12 (1842).

ARENARIA **dianthifolia** (Boiss.), n. comb. *Alsine dianthifolia* Boiss. Diagn. ser. 1, fasc. 8, 99 (1849).

ARENARIA **intermedia** (Boiss.), n. comb. *Alsine intermedia* Boiss. Fl. Orient. i. 685 (1867).

ARENARIA **leucocephala** (Boiss.), n. comb. *Alsine leucocephala* Boiss. Diagn. ser. 1, fasc. 1, 45 (1842).

ARENARIA **pulvinaris** (Boiss.), n. comb. *Alsine pulvinaris* Boiss. Diagn. ser. 1, fasc. 1, 46 (1842), fasc. 5, 84 (1844).

ARENARIA **makmelensis**, n. nom. *Alsine libanotica* Boiss. Diagn. ser. 1, fasc. 8, 98 (1849), not *Ar. libanotica* Kotschy in Boiss. Fl. Orient. i. 699 (1867). Known only from the alpine region of Makmel, Lebanon, at 2590 m.

ARENARIA **rimarum** (Boiss. & Balansa), n. comb. *Alsine rimarum* Boiss. & Balansa in Boiss. Fl. Orient. i. 678 (1867).

ARENARIA **Schimperii** (Hochst.), n. comb. *Alsine Schimperii* Hochst. in A. Rich. Tent. Fl. Abyss. i. 47 (1847).

ARENARIA **stellata** (Clarke), n. comb. *Cherleria stellata* Clarke, Trav. iv. 211 (1816). *Alsine parnassica* Boiss. & Sprun. Diagn. ser. 1, fasc. 1, 46 (1842).

ARENARIA **diversifolia** (Dolliner), n. comb. *Moehringia diversifolia* Dolliner ex Koch, Flora, xxii. 2 (1839).

ARENARIA **Grisebachii** (Janka), n. comb. *Moehringia Grisebachii* Janka, Oesterr. Bot. Zeitschr. xxiii. 194 (1873).

ARENARIA **Jankae** (Griseb.), n. comb. *Moehringia Jankae* Griseb. ex Janka, Oesterr. Bot. Zeitschr. xxiii. 195 (1873).

ARENARIA **dasyphylla** (Bruno), n. comb. *Moehringia dasyphylla* Bruno in Balbis, Misc. Bot. in Mém. Acad. Turin Sc. Phys. i. 391 (1804).

ARENARIA DASYPHYLLA, var. **sedoides** (Cumino), n. comb. *Moeh-*

ringia muscosa β . *sedoides* Cumino in Balb. Mém. Acad. Turin Sc. Phys. i. 391 (1804).

ARENARIA **Tommasinii** (Marches.), n. comb. *Moehringia Tommasinii* Marches. Bull. Adr. Soc. Sc. Nat. Trieste, v. 327 (1880).

ARENARIA **glauco-virens** (Bertol.), n. comb. *Moehringia glauco-virens* Bertol. Fl. Ital. vi. 626 (1844).

ARENARIA POLYGONOIDES Wulf., var. **obtusa** (All.), n. comb. *A. obtusa* All. Fl. Pedem. ii. 114, t. 64, fig. 4 (1785). *Moehringia ciliata* (Scop.) Dalla Torre, var. *obtusa* (All.) Gürke, Pl. Eur. ii. 280 (1899).

ARENARIA **papulosa** (Bertol.), n. comb. *Moehringia papulosa* Bertol. Fl. Ital. iv. 363 (1839).

ARENARIA **platysperma** (Maxim.), n. comb. *Moehringia platysperma* Maxim. Bull. Acad. Petrop. xviii. 373 (1873).

ARENARIA **Cossoniana**, n. nom. *Moehringia stellarioides* Coss. Bull. Soc. Bot. Fr. ix. 170 (1862), not *Ar. stellarioides* Willd. in Schlecht. Ges. Naturf. Fr. Berl. Mag. vii. 209 (1813).

II. THE TYPE OF THE GENUS ALSINE.

As published by Linnaeus *Alsine* consisted of two species as follows:

ALSINE.

- media*. 1. ALSINE petalis bipartitis, foliis ovato-cordatis. *Fl. lapp.* 186. *Fl. suec.* 369. *Hort. cliff.* 173. *Gron. virg.* 161. *Roy. lugdb.* 449.
Alsine media. *Bauh. pin.* 250.
Alsine minor. *Dod. pempt.* 29.
Habitat in Europae cultis. ☉
- segetalis*. 2. ALSINE petalis integris, foliis subulatis.
Spergula foliis filiformibus unum latus spectantibus, stipulis membranaceis vaginantibus, pedunculis umbellatis. *Guett. stamp.* 299. *Dalib. paris.* 133.
Alsine segetalis, gramineis foliis unum latus spectantibus. *Vaill. paris.* 8. t. 3. f. 3.
Habitat Parisiis. ☉¹

By many scholarly European botanists, Hiern,² Britton & Rendle,³ Schinz & Thellung,⁴ Briquet,⁵ and others, *A. segetalis* is taken with-

¹ L. Sp. Pl. i. 272 (1753).

² Hiern, Journ. Bot. xxxvii. 317, 318 (1899).

³ Britten & Rendle, List Brit. Seed-Pl. 6 (1907).

⁴ Schinz & Thellung, Bull. Herb. Boiss. sér. 2, vii. 402, 404 (1907).

⁵ Briq. Fl. Corse, i. 529 (1910).

out question as the type of the Linnean *Alsine*, and since *A. segetalis* belongs to the genus known variously as *Spergularia* Pers. (1805), *Tissa* Adans. (1763) or *Buda* Adans. (1763) it is obvious that *Alsine* is synonymous with them. By the International Rules *Spergularia*, being a *nomen conservandum*, is retained over all competitors, but by those who attended the International Congress at Vienna as regular Commissioners or as delegates but who have felt no obligation to accept the majority rulings of that representative convention¹ and by those who prefer the provincial American Code to an international agreement, the name *Alsine* L. should be used for *Tissa*, *Buda*, or *Spergularia*.

It is not clear upon what ground followers of the American Code apply the name *Alsine* to *Stellaria* L. The American Code is explicit as to the type of a Linnean genus, and by its ruling the type of *Alsine* is unquestionably *A. segetalis*. The portions of the American Code bearing upon this point are in Canon 15:

"The nomenclatorial type of a genus or subgenus is the species originally named or designated by the author of the name. If no species was designated, the type is the first binomial species in order eligible under the following provisions:

"(b) A figured species is to be selected rather than an unfigured species in the same work. In the absence of a figure, preference is to be given to the first species accompanied by the citation of a specimen in a regularly published series of exsiccatae. IN THE CASE OF GENERA ADOPTED FROM PREBINOMIAL AUTHORS (WITH OR WITHOUT CHANGE OF NAME), A SPECIES FIGURED BY THE AUTHOR FROM WHOM THE GENUS IS ADOPTED SHOULD BE SELECTED. [Capitalization of the last sentence ours.]

EXAMPLES.—*Lespedeza* Michx. Fl. Bor. Am. 2: 70 (1803), is typified by *L. procumbens* Michx. loc. cit. pl. 39, the species first figured."

Now, referring to *Alsine* L., there were but two species: 1st, *A. media*, which is *Stellaria media* Vill. and 2d *A. segetalis*, which is

¹ Even the most painstaking students sometimes fail to view international agreements subjectively. Thus, Dr. Witmer Stone, writing in September, 1911, finds it "quite impossible to accept certain of the features of these codes [the International Rules and the American Code]" — *Plants So. N. J.* 34 (1911); and, therefore, as a zoölogist making a temporary excursion into the botanical field, adopts in his botanical writing methods which are quite at variance with those sanctioned by either the International Rules or the American Code. Nevertheless, when certain zoölogists proposed alterations of their International Code of Nomenclature, Dr. Stone felt, in May, 1912, as most of us do, that, "if we are to shift back and forth to accommodate the views of now one coterie of investigators, now another, we might as well abolish all codes and lapse into nomenclatural chaos" — *Science*, n. s. xxxv. 818 (1912).

Spergularia segetalis Don. The references under the 1st species, *Alsine media*, indicate no figure, but the 2d species, *A. segetalis*, goes back to "*Alsine segetalis*, *gramineis foliis unum latus spectantibus*. Vaill. paris. 8. t. 3. f. 3," which shows a beautifully clear illustration. By the American Code, therefore, the type of *Alsine* is *A. segetalis*.

The definition of *Alsine* in the *Genera Plantarum*, ed. 5, 132 (1754) likewise indicates *A. segetalis* in the character "Cor. Petala quinque aequalia, calyce longiora," for in *A. segetalis* the petals are, as described by Rouy & Foucaud, "une fois plus longs que les sépales"¹ while the petals of *A. media* are, as defined by Britton in his key to species, "shorter than the calyx."² Incidentally, it is unfortunate for Dr. Britton's argument that *A. media* is the type of *Alsine* that he should have selected for his artist a flower of the latter which so beautifully shows 10 stamens (Ill. Fl. fig. 1752), for both in the *Genera Plantarum* and in the *Species Plantarum* the genus *Alsine* was placed in the *Pentandria Trigynia* and in the definition of the genus Linnaeus distinctly said "*Filamenta quinque*." In *A. media* plants with 5 stamens do sometimes occur, but in *A. segetalis* this number is tolerably constant.

It should be sufficiently clear, then, that Hiern, Britten & Rendle, Schinz & Thellung, and Briquet are correct in making *Alsine segetalis* the type of the genus, and that in not so doing the professed followers of the American Code are violating Canon 15 *b* of that code.

III. THE EARLIER NAMES FOR ALSINOPSIS.

Very recently Small has rechristened *Alsine* Wahlenb., not L., as *Alsinopsis*,³ transferring to it many eastern American species, *Alsinopsis groenlandica*, *A. glabra*, *A. stricta*, *A. caroliniana*, etc. but designating no type except "*Alsine* Wahl., not L.," and more recently others, content to follow Small without looking into the validity of his work or into the literature which he has so obviously ignored, have given us the new combinations *Alsinopsis verna* (L.) Cockerell, based on *Arenaria verna* L., *Alsinopsis propinqua* (Richardson) Rydberg, based on *Arenaria propinqua* Richardson, *Alsinopsis sajanensis*

¹ Rouy & Foucaud, Fl. de France, iii. 301 (1896).

² Britton in Britton & Brown, Ill. Fl. ed. 2, ii. 42 (1913).

³ Small, Fl. S. E. U. S. 419, 1330 (1903).

(Willd.) Cockerell, based on *Arenaria sajanensis* Willd., *Alsinopsis arctica* (Stev.) Heller, based on *Arenaria arctica* Stev., etc. etc.

Nevertheless, had they looked into the standard works of reference, without study of which no taxonomist should allow himself to publish, they would have found that the plants which made up the original *Alsine* Wahlenb.¹ and the species which are universally placed with them have already had more than a grocer's dozen of generic names most if not quite all of which are clear from duplication! The sounder European botanists reduce *Alsine* Wahlenb. to the Linnean *Minuartia* (1753), but if *Minuartia* is held to be distinct there are still plenty of names from which to select. *Leptophyllum* Ehrh. Beitr. iv. 147 (1789),² was based on *Arenaria tenuifolia* L. which is placed by Pax

¹ Wahlenb. Fl. Lap. 127 (1812).

² The International Rules of Botanical Nomenclature wisely state that "The mere indication of species as belonging to a new genus... does not allow us to accept the genus... as characterized and effectively published"; but the so-called "American" Code rules that a genus is published by "a reference to a specific description, which is associable by citation with a previously published binomial species," the authors of the American Code regarding the retention by the International Congress of *nomina conservanda* as "in the highest degree arbitrary, as controverting a cardinal principle [priority of publication]" — Am. Code of Bot. Nom. in Bull. Torr. Bot. Cl. xxxiv. 167, 168 (1907). As an illustration of such publication of a genus the American Code states that: "*Dryopteris* Adans. Fam. Pl. 2: 20 (1763), is published with a reference to a specific description associable by citation with the previously published *Polypodium Filix-mas* L. Sp. Pl. 1090 (1753), inasmuch as both Adanson and Linnaeus cite *Filix mas* of Fuchs." (Canon 10, Examples). However, when one turns to the page in Adanson stated in the American Code which was devised "To reach greater precision" (p. 167), he finds no mention, as is stated in the Code, of *Filix mas*; merely the following:

" <i>Dryopteris</i>	Id. [referring to the characterization of <i>Filix</i>].	Id. [Enveloppe] enparasol.	Id."
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In other words, on page 20 there is no mention of *Filix mas*, and the only word of diagnosis "enparasol" describes the *pellate* indusium of *Polystichum*, not the reniform indusium of *Filix mas*. The American Code would have won more respect for its "precision" if it had stated the fact, that the only reference to *Filix mas* is on p. 551, in the index or "table," where it is placed not under "*Dryopteris*" but under "*Druopteris*."

But surely if *Dryopteris* satisfies the American Code as good publication of a genus, *Leptophyllum* Ehrh. Beitr. iv. 147 (1789) based, as stated, on *Arenaria tenuifolia* L., is admirably published. Some other generic names similarly published on the same or adjacent pages, which by the American Code, but not by the International Rules, should be taken up are

PHAECEPHALUM Ehrh. l. c., 146 (1789), based on *Schoenus fuscus* L. = RYNCHOSPORA Vahl (1806).

HYDROPHILA Ehrh. l. c. (1789), based on *Tillaea aquatica* L., which was also the type of TILLAEASTRUM Britton (1903).

TRICHOPHYLLUM Ehrh. l. c. 147 (1789), based on *Scirpus acicularis* L. = ELEOCHARIS R. Br. (1810).

MONANTHIUM Ehrh. l. c. 148 (1789), based on *Pyrola uniflora* L., which was the type of MONESES Salisb. (1821).

HELICTONIA Ehrh. l. c. (1789), based on *Ophrys spiralis* L., which was also the type of IBIDIUM Salisb. (1812).

AETOPTERON Ehrh. l. c. (1789), based on *Polypodium aculeatum* L. = POLYSTICHUM Roth (1799).

Is it possible that these are all of Ehrhart's names the neglect of which, by those whose code calls for priority of publication at all costs, is likely to seem "in the highest degree arbitrary"?

under the subgenus *Eualsine* and should therefore be a fairly typical member of the genus. *Someraucra* Hoppe, *Flora*, ii. 26 (1819) with the single species *S. quadrifaria* is identified by all modern European botanists as *Arenaria octandra*¹ or *Alsine octandra* (Sieb.) Kern. while *Siebera* of the same author, l. c. 24 (1819) with a single species *S. cherlerioides* is likewise considered inseparable from *Arenaria octandra*. *Sabulina* Reichenb. *Fl. Germ. Excurs.* 785 (1832) contained 25 species, the first one, *S. tenuifolia*, based upon the same *Arenaria tenuifolia* L. which was the sole type of Ehrhart's *Leptophyllum*. Some other species were *S. verna*, based upon *Arenaria verna* L., one of the original species in Wahlenberg's genus *Alsine* and the plant now renamed *Alsinopsis verna* (L.) Cockerell, *Am. Nat.* xl. 864 (1906); *S. laricifolia*, based on the Linnean *Arenaria laricifolia*, one of the species which later formed the basis of the genus *Wierzbickia* Reichenb. *l.c. Fl. Germ.* v. 30 (1841), and which now appears as *Alsinopsis laricifolia* (L.) Heller, *Muhlenbergia* viii. 96 (1912); *S. stricta*, based upon *Spergula stricta* Swartz, which was the first species of Wahlenberg's *Alsine*, the type of Small's genus *Alsinopsis*, and *S. biflora*, based upon *Stellaria biflora* L., which was the basis of *Alsine biflora* (L.) Wahlenb. *Fl. Lapp.* 128 (1812) and therefore one of the types of *Alsinopsis* Small, which afterward appeared as a type of the genus *Alsinanthe* Reichenb. *l.c. Fl. Germ.* v. 29 (1841) and which is identical with *Arenaria sajanensis* Willd., which has now taken on another alias, *Alsinopsis sajanensis* (Willd.) Cockerell, *Am. Nat.* xl. 864 (1906). Reichenbach had still more generic names for members of the genus *Alsine* Wahlenb., not L. For instance *Tryphane*, Reichenb. l. c. 28 (1841), which included *T. verna*, based on *Arenaria verna*, which had already been one of the original species of *Alsine* Wahlenb., and which, as above pointed out, has been rechristened *Alsinopsis verna* by Cockerell; or *Facchinia* Reichenb. l. c. 29 (1841), based on *Arenaria lanceolata* All., which is the *Alsine rupestris* (Scop.) Fenzl; or *Neumayera* Reichenb. l. c. 30 (1841) with the two species *N. austriaca* and *N. Villarsii*, which are *Ar. austriaca* Jacq. or *Alsine austriaca* (Jacq.) Wahlenb. *Fl. Lapp.* 129 (1812) and therefore belonging with *Alsinopsis* Small; and *Ar. Villarsii* Balbis or *Alsine Villarsii* (Balbis) Mert. & Koch.

As if Reichenbach had not already provided enough generic names for *Alsine* Wahlenb. not L., Gay in 1845 published the genus *Greniera*

¹ *ARENARIA octandra* (Sieb.), n. comb. *Cherleria octandra* Sieb. *Fl. Austr. Exs.* n. 149 (1813) *Alsine octandra* (Sieb.) Kern. *Sched. Flor. Exs. Austro-Hung.* ii. n. 564 (1882).

J. Gay, Ann. Sci. Nat. sér. 3, iv. 27 (1845) with the two American species, *G. Douglasii* and *G. tenella* based on *Alsine Douglasii* Fenzl and *Arenaria tenella* Nutt.; but, disregarding the name *Greniera*, which had never been published for a genus prior to Gay's use of it, Heller enriches the synonymy with the names *Alsinopsis Douglasii* (Fenzl) Heller, *Muhlenbergia*, viii. 20 (1912) and *Alsinopsis tenella* (Nutt.) Heller, l. c. 96 (1912). There are still other names which might be discussed, *Xeralsine* Fourr., etc.; but it is sufficiently clear that even if we keep *Alsine* Wahl. distinct from *Arenaria*, there are plenty of well published names for it which antedate by many decades *Alsinopsis* Small; and, furthermore, the three species which were formally described by Wahlenberg under his *Alsine*, the basis of *Alsinopsis*, are members of the following so-called genera:

ALSINE STRICTA (Swartz) Wahlenb. belongs to ALSINELLA Swartz (1814), a name antedated by *Alsinella* Moench (1794); to SABULINA Reichenb. (1832), a name which had not been previously used for a genus; and to ALSINANTHE Reichenb. (1841), again a perfectly valid generic name.

ALSINE BIFLORA (L.) Wahlenb. belongs likewise to ALSINELLA Swartz (1814); to SABULINA Reichenbach (1832); and to ALSINANTHE Reichenb. (1841).

ALSINE RUBELLA Wahlenb. belongs likewise to ALSINELLA (1814) and to SABULINA (1832); while *A. verna*, to which *A. rubella* is so closely related as often to be considered conspecific, was one of the original species of TRYPHANE Reichenb. (1841), again a name which had not been previously used.

There is, then, no possible need for the generic name *Alsinopsis* Small.

IV. THE AMERICAN REPRESENTATIVES OF ARENARIA SAJANENSIS.

The plants which were included by Robinson in the *Synoptical Flora* under *Arenaria sajanensis* Willd. prove, when better understood, to be four quite definite species, which may be distinguished by the following characters:

The few short filiform herbaceous or subherbaceous basal shoots bearing obscurely keeled leaves: petals 0.5–1 mm. wide, shorter than to barely exceeding the glabrous or puberulent sepals: anthers 0.2–0.3 mm. long: capsule 4–6 mm. long, with membranaceous pale valves: seeds smooth, reniform-orbicular, not obviously beaked, 0.6–0.8 mm. in diameter.

A. sajanensis.

The crowded trailing freely forking subligneous branches densely clothed with highly marcescent thick-ribbed leaves: petals 1.5–2.5 mm. broad, conspicuously exceeding the pilose or hirsute sepals: anthers 0.5–1 mm. long: capsule 6–10 mm. long, with firm stramineous valves: seeds reniform-obovate, with the micropyle prolonged into a beak, 0.7–1.2 mm. long.

Leaves round-tipped.

Leaves oblong, ciliolate, pale-green, 1–5 mm. long, about 1 mm. broad, very densely imbricated: calyx glandular: seed rugose or papillose.....*A. obtusiloba*.

Leaves linear, glabrous-margined, deep green, 4–8 mm. long, 0.3–0.5 mm. broad, loosely imbricated: calyx not glandular: seed smooth or obscurely pebbled.....*A. marcescens*.

Leaves sharp at apex.....*A. laricifolia*.

A. SAJANENSIS Willd. in Schlecht. Berl. Gesell. Nat. Fr. Mag. vii. 200 (1816); Seringe in DC. Prodr. i. 408 (1824). *Stellaria biflora* L. Sp. Pl. 422 (1753), not *Arenaria biflora* L. Mant. 71 (1767). *Cerastium biflorum* (L.) Crantz, Inst. ii. 402 (1766). *Alsine biflora* (L.) Wahlenb. Fl. Lapp. 128 (1812). *Alsinella biflora* (L.) Swartz, Summ. Veg. Scand. 17 (1814). *Ar. occulta* Fisch. ex Seringe in DC. Prodr., i. 408 (1824). *Ar. polygonoides*, β *occulta* Ser. in DC. l. c. (1824). *Ar. scandinavica* Spreng. Syst. ii. 402 (1825). *Sabulina biflora* (L.) Reichenb. Fl. Germ. Excurs. 790 (1832). *Ar. stenopetala* Turcz. Bull. Soc. Nat. Mosc. (1838) 89. *Ar. alpina* Porter & Coult. Syn. Fl. Colo. 14 (1874), chiefly. *Ar. biflora* Watson, Bibl. Ind. 94 (1878), not L. *Alsinanthe biflora* (L.) Reichenb. Ic. Fl. Germ. v. 30. t. 209 fig. 4939 (1842). *Ar. sphagnoides* Thomas ex Koch, Syn. Fl. Germ. ed. 2, 123 (1843). *Alsinopsis sajanensis* (Willd.) Cockerell, Am. Nat. xl. 864 (1906).—Arctic regions, south with us to the Torngat Mts., Labrador, the Shickshock Mts., Gaspé Co., Quebec, and alpine regions of Arizona and Oregon. The following specimens belong here. GREENLAND: Baals Revier, *J. Vahl*; Pilekrat ved S. Kangerdluarsuk Fjord, Holsteinsborg Distr., August 5, 1884, *Warming & Holm*. HUDSON STRAITS: Nottingham Island, August 24, 1884, *R. Bell*. LABRADOR: Rama, July 15–August 30, 1894, July–August, 1899, *A. Stecker*, nos. 208, 355, August 20–24, 1897, *J. D. Sornborger*, no. 286 (distributed as *A. verna*, var. *hirta*); Kangalaksiorvik Bay, September 1–10, 1908, *Owen Bryant*; Hebron, *Mentzel*; Okkak, *Frates Morav*. QUEBEC: Mt. Albert, Gaspé Co., July 25–27, 1881, *J. A. Allen*; crevices and detritus of serpentine, barrens and brook-ravines, alt. 700–1050 m., Mt. Albert, August 8–15, 1905, *Fernald & Collins*, no. 77; July 25, 1906, *Fernald & Collins*, no. 550. ALBERTA: meadows above Banff, July 8, 1907, *Butters & Holway*, no. 91; Elbow River, June, July, 1897, *J. Macoun*, no. 18, 286; Silver City, August 6, 1885, *J. Macoun* (distributed as *A. arctica*); Mt. Molar, alt. 1980 m., July 9, 1904, *J. Macoun*, no. 64, 688; Lake Louise, alt. 2200 m., July 20, 1904, *J. Macoun*, no. 64, 687; Pipestone Creek, alt. 1980 m., July 7, 1904, *J. Macoun*, no. 64, 689; summit of Otterhead Pass, alt. 2135 m., August 10, 1904, *J. Macoun*,

no. 64,690. MONTANA: Upper Marias Pass, alt. 2440 m., August 4, 1883, *W. M. Canby*, no. 44; Old Hollowtop, near Pony, alt. 2745 m., July 7, 1897, *Rydberg & Bessey*, no. 4041. WYOMING: Teton Mts., August 21, 1894, *Aven Nelson*, no. 1009. COLORADO: Gray's Peak, alt. 3965 m., August 15, 1885, *Letterman*; high mountains, Gray's Peak and vicinity, alt. 3350-4270 m., 1885, *Patterson*; Twin Lakes, 1875, *Brandegee*; South Park, *Wolf & Rothrock*, nos. 343, 344; Mt. Ouray, alt. 3660 m., August 20, 1901, *C. F. Baker*, no. 841. UTAH: Uinta Mts., alt. 3350 m., August, 1869, *Watson*, no. 173. ARIZONA: summit of Mt. Agassiz, August, 1884, *Lemmon*, no. 3289. OREGON: cliffs of Wallowa Mts., alt. 2745 m., July 31, 1899, *Cusick*, no. 2301a. WASHINGTON: Cascade Mts. near Mt. Baker, July 16, 1898, *J. B. Flett*, no. 860; Engel Creek near Mt. Stewart, 1883, *Brandegee*, no. 672. BRITISH COLUMBIA: mountain summits, alt. 2290 m., Kicking Horse Lake, July, 1885, *J. Macoun*; summits of Selkirk Mts., alt. 1675-2440 m., August 2-4, 1890, *J. Macoun*, nos. 13, 16; summit of Rocky Mts., alt. 2135 m., August 18, 1890, *J. Macoun*, no. 15; small peak above timber line, alt. 2285 m., Selkirk Mts., July 26, 1905, *C. H. Shaw*, no. 1037; summit of Mt. Arrowsmith, Vancouver I., July 16, 1887, *J. Macoun*.

A. obtusiloba (Rydberg), n. comb. *A. obtusa* Torr. Ann. Lyc. N. Y. ii. 170 (1826) not All. Fl. Pedem. ii. 114 (1785). *A. arctica* γ Torr. & Gray, Fl. i. 181 (1838). *A. biflora*, var. *obtusiloba* (Torr.) Watson, Bibl. Ind. 94 (1878). *Alsinosopsis obtusiloba* Rydberg, Bull. Torr. Bot. Cl. xxxiii. 140 (1906), as to first citation, *Ar. obtusa* Torr., but only in small part as to other citations (see discussion below).—Alberta to New Mexico. The following belong here. ALBERTA: Sheep Mt., Waterton Lake, July 28-31, 1895, *J. Macoun*, no. 10,094. MONTANA: Bridger Mts., August 21, 1902, *W. W. Jones*; Spanish Peaks, 1901, *J. Vogel*; Old Hollowtop, near Pony, alt. 2440 m., July 7, 1897, *Rydberg & Bessey*, no. 4039. WYOMING: stony sub-alpine parks, Brooklyn Lake, Albany Co., August, 1909, *Aven Nelson*, no. 9235; open hillsides, Telephone Mines, Albany Co., August 3, 1900, *Aven Nelson*, no. 7951; Little Bald Mt., Bighorn Mts., July 13, 1900, *J. G. Jack*. COLORADO: high mountains, Gray's Peak and vicinity, alt. 3350-4270 m., July and August, 1885, *H. N. Patterson*, no. 11; alpine, Pikes Peak, August 27, 1895, *Canby*; alpine ridges east of Middle Park, 1861, *Parry*, no. 141; barren rocky places above the limit of trees on James Peak, August 18, 1870, *E. L. Greene*; Sierra Blanca, 1877, *Hooker & Gray*; South Park, 1873, *Wolf & Rothrock*, no. 364; among rocks at 3660 m., mountain northwest of Como, July 31, 1895, *Crandall & Cowen*, no. 82; Mt. Garfield, alt. 3800 m., July 25, 1901, *F. E. & E. S. Clements*, no. 496; near Pagosa Peak, alt. 3500 m., August, 1899, *C. F. Baker*, no. 310 (distributed as *A. verna*). UTAH: moist soil, alt. 3810 m., La Sal Mts., Grand Co., July 15, 1912, *E. P. Walker*, no. 279. NEW MEXICO, northern New Mexico, 1867, *Parry*, no. 17.

According to *Index Kewensis*, *Arenaria alpina* Porter & Coulter, Syn. Fl. Colo. 14 (1874) is *A. obtusa* Torr., but it is in every way inadvisable to take up the name. Porter & Coulter obviously supposed they were listing a Linnean species, although Linnaeus had no *A. alpina*. They cite *Alsine biflora* Wahl. as a synonym, i. e. *Arenaria sajanensis* Willd; their description of the leaves as "narrowly linear, 3''–3½'' long" belongs clearly to *A. sajanensis*, not *A. obtusa* Torr. and their citation, *Hall & Harbour* 77 is inconclusive, since no. 77, at least in the Gray Herbarium, is a mixed number, consisting mostly of *A. sajanensis*.

The name *Alsinopsis obtusiloba* Rydberg is not much clearer in its application, although it may be fairly inferred that Rydberg was changing the name of *Arenaria obtusa* Torr. on account of Allion's earlier species of that name. But the other citations given by Rydberg are not helpful: *Ar. biflora* Wats. was based definitely on *Alsine biflora* Wahl. and is, therefore, *Ar. sajanensis* Willd; while "*Arenaria sajanensis* Robinson, Proc. Am. Acad. 29: 304. 1894. Not *A. sajanensis* Willd. 1816" was largely *A. sajanensis* Willd, but with all the species here discussed, *A. obtusiloba*, *A. marcescens* and *A. laricifolia*? confused with it. Only through inferring, then, that Rydberg's *Alsinopsis obtusiloba* was intended as a renaming of *Ar. obtusa* Torr. does Rydberg's name become definite.

A. marcescens, n. sp., dense caespitans, caudiculis epigaeis lignescens ramosissimis 0.5–2.5 dm. longis, foliorum remnantibus marcescentibus rigidis imbricato-tunicatis; foliis coriaceis viridibus glaberrimis lineari-setaceis obtusis 4–8 mm. longis 0.3–0.5 mm. latis, nervo crasso; cauliculis adscendentibus 2–5 cm. altis 1-floris glanduloso-pilosis remote bracteatis, bracteis 2–4-jugis lanceolato-subulatis; pedunculo 0.6–1.5 cm. longo; calycibus purpurascenscentibus vel fuscis turbinato-campanulatis 3.8–5 mm. longis basi plus minusve pilosis, sepalis oblongis vel oblongo-lanceolatis obtusis valde carinatis plerumque nerviis lateralibus; petalis spathulatis vel spathulato-obovatis albis vel lilacinis basi luteis 6–8 mm. longis 2–2.5 mm. latis; antheris albidis 0.5–1 mm. longis; capsula subcylindrica 0.6–1 cm. longa; valvis coriaceis stramineis lineari-oblongis apice emarginatis; seminibus olivaceis vel brunneis reniformi-obovatis, laevissimis 0.8–1.2 mm. longis apice radiculari rostellata.

Densely caespitose, with the trailing and freely forking lignescent branches 0.5–2.5 dm. long and closely covered with the rigid marcescent remnants of the leaves: leaves coriaceous, bright green, strictly glabrous, linear-setaceous, obtuse, 4–8 mm. long, 0.3–0.5 mm. wide, with a thick midrib: flowering stems ascending, 2–5 cm. high,

1-flowered, glandular-pilose, remotely bracted, with 2-4 pairs of short lance-subulate bracts: peduncle 0.6-1.5 cm. long: calyces purplish or fuscous, turbinate-campanulate, 3.8-5 mm. long, more or less pilose at base; the oblong or oblong-lanceolate obtuse sepals strongly keeled and usually with 2 lateral nerves: petals spatulate or spatulate-obovate, white or lilac, yellow at base, 6-8 mm. long, 2-2.5 mm. wide: anthers whitish, 0.5-1 mm. long: capsule subcylindric, 0.6-1 cm. long; its coriaceous stramineous linear-oblong valves emarginate; seeds olive or brown, very smooth, reniform-obovate, 0.9-1.2 mm. long, with the tip of the radicle prolonged into a beak.—Serpentine and magnesian limestone ledges and gravel, western Newfoundland and Gaspé Co., Quebec. NEWFOUNDLAND: serpentine tablelands, altitude about 380 m., Bonne Bay, August 27, 1910, *Fernald, Wiegand & Kittredge*, no. 3366; serpentine and magnesian limestone barrens, northeastern bases and slopes of Blomidon ("Blow-me-down") Mts., July 24, 1910, *Fernald, Wiegand & Kittredge*, no. 3365 (TYPE in Gray Herb.), August 21, 1910, *Fernald & Wiegand*, no. 3365a (ripe seeds of no. 3365); Blomidon Range, July 3-5, 1911, *C. C. Stewart*, no. 13; sandy plains, Serpentine (or Coal) River, July 16, 1896, *Waghorne* no. 6 (distributed as *A. verna*). QUEBEC: Mt. Albert, Gaspé Co., July 31, 1881, *J. A. Allen*, no. 4 (distributed as *A. groenlandica* or *A. arctica*); Shickshock Mts. (presumably Mt. Albert), 1882, *J. Macoun*; crevices and detritus of serpentine, barrens and brook-ravines, alt. 900-1058 m., Mt. Albert, August 8, 1905, *Fernald & Collins*, no. 78, July 23, 1906, *Fernald & Collins*, nos. 551, 552.

The *Fernald & Collins* and *Fernald & Wiegand* material has been distributed as *A. arctica* Stev.; but *A. arctica* has broader leaves, glandular calyx and very large broadly obovate petals.

?*A. LARICIFOLIA* L. Sp. Pl. i. 424 (1753). *Ar. striata* L. Amoen. Acad. iv. 315 (1756) in part, not All. *Alsine laricifolia* (L.) Crantz, Inst. ii. 407 (1766). *Stellaria laricifolia* (L.) Scop. Fl. Carn. ed. 2, i. 317 (1772). *Sabulina striata* (L.) Reichenb. Fl. Germ. Excurs. 789 (1832). *Alsine striata* (L.) Gren. Mem. Soc. Doubs (1841) 33, t. 1, fig. 1. *Wierzbickia striata* (L.) Reichenb. Ic. Fl. Germ. v. 30, t. 211, fig. 4932 (1842). *Alsinopsis laricifolia* (L.) Heller, Muhlenbergia, viii. 96 (1912).—The plant which is passing in America as *Arenaria laricifolia* is more western and northern than *A. obtusiloba*, occurring from Yukon and Alaska to northwestern Wyoming, Nevada and Oregon. There is doubt as to just what Linnaeus had as *Ar. laricifolia* and a further doubt as to whether our American plant is identical with the European. The material seen by the writer is all fragmentary and until it is better known may pass as *A. laricifolia*. It is highly important to secure abundant flowering and fruiting specimens for critical study. The following specimens are tentatively referred here. YUKON: Yukon River, August 15, 1887, *Dawson*;

Bonanza Creek, Dawson, June 12, 1914, *Eastwood*, no. 204; Dawson Slide, Dawson, June 12, 1914, *Eastwood*, no. 207. MONTANA: Bald Mt., alt. 3050 m., July 22, 1880, *S. Watson*, no. 54; plains near Cut-bank Creek, August 5, 1883, *Canby*, no. 45. WYOMING: high mountains, Yellowstone Park, August 13, 1893, *J. N. Rose*, no. 483. NEVADA: East Humboldt Mts., alt. 3050 m., August, 1868, *Watson*, no. 173. OREGON: on cliffs at 2440 m., Eagle Creek Mts., 1881, *Cusick*, no. 969. WASHINGTON: rocky ridges near snow, at 2440 or 2740 m., Mt. Paddo, September 15, 1883, *Suksdorf*, no. 175.

V. THE SPECIFIC IDENTITY OF *ARENARIA GROENLANDICA* AND *A. GLABRA*.

It has been customary to treat the boreal *Arenaria groenlandica* (Retz.) Spreng. and the more southern *A. glabra* Michx. as distinct species, the former extending from Greenland to the higher granitic mountains of New England and New York and locally southward along the Alleghenies to the mountains of North Carolina, the latter confined to the mountains of North Carolina, Tennessee and Georgia. The characters as stated by those who maintain the two as species are as follows:¹

A. GROENLANDICA. Stems 2-8 in. long, 1-5-flowered (*Robinson*); 3-20 cm. tall, sparingly forked (*Small*): leaves linear, $1\frac{1}{2}$ -7 lines long, the basal in a dense cluster (*Robinson*); leaf-blades filiform to subulate, 0.3-1.5 cm. long, the basal in a dense cluster (*Small*): pedicels 0.5-1.5 cm. long (*Small*): sepals broadly ovate, $1\frac{1}{2}$ -2 lines long (*Robinson*); sepals oblong or oblong-lanceolate, 3-4 mm. long (*Small*): petals obovate (*Robinson*, *Small*): capsule subglobose to oblong (*Robinson*); capsule ovoid, or rarely subglobose or nearly oblong, 5-6 mm. long (*Small*).

A. GLABRA. Stems 6-12 in. high (*Robinson*); stems 0.5-3 dm. tall, often bushy (*Small*): leaves narrowly linear, equaling or exceeding the internodes (*Robinson*); leaf-blades narrowly linear or nearly filiform, 1-2.5 cm. long (*Small*): pedicels elongated (*Robinson*); pedicels 1-4 cm. long (*Small*): sepals ovate-oblong, $1\frac{1}{2}$ lines long (*Robinson*); sepals oblong or ovate-oblong, 2.5-3 mm. long (*Small*): petals spatulate (*Small*): capsule ovoid (*Robinson*); capsule ovoid, 3 mm. long (*Small*).

That the specific lines between the two are not satisfactory has long been evident from the fact that plants referred by one author to *A.*

¹ These characters are taken from the treatments by Robinson in Gray, Synop. Fl. i. 243 (1897) and by Small, Fl. S. E. U. S. ed. 2, 420 (1913).

glabra have been referred by others to *A. groenlandica*; and examination of herbarium-material shows at once that the characters depended upon are far from constant. Thus material of most typical *A. groenlandica* from Greenland and Labrador and the highest New England mountains shows sepals varying from 3–5 mm. in length, while plants of good *A. glabra* from the South (for example, *Biltmore Herb.* no. 664 from North Carolina; *Curtiss*, no. 304 from Nashville, Tennessee; and sheets from Lookout Mountain, near the line between Tennessee and Georgia), with pedicels up to 4.5 cm. long and with cauline leaves up to 3 cm. long, have sepals 3–5 mm. long, i. e. with the same variation in length as those of *A. groenlandica*. Similarly with the capsules: the material from Lookout Mountain, with long leaves and pedicels, has capsules up to 5.5 cm. long, while fully ripe material from Table-Top Mt., Gaspé, has the capsules less than 4 mm. long. The stems of the boreal plant may be as freely forking as the austral, having 1–30 flowers, while characteristic southern plants with long leaves and pedicels may have the stems subsimple or with only few flowers. The Lookout Mt. material collected by Judge Churchill has the petals as long and as broad as much of the northern material; and the seeds of the northern and southern specimens are quite alike.

Nevertheless in spite of the absence of good specific characters in the seeds (which usually display the best of specific differences in *Arenaria*), in the capsules, petals and sepals, there is a "look" about the two extremes which indicates that they are not strictly identical. The boreal *A. groenlandica* is more tufted and lower, usually with more developed basal leafy shoots; its cauline leaves are shorter; its pedicels become less elongate, and its petals are inclined to be longer. This typical *A. groenlandica* is confined in New England and New York to the very highest mountains, descending along brooks in the White Mountains only to 885 m. and occurring on the summit of Mt. Monadnock, New Hampshire, above 915 m.; in Vermont it is only on the summits of Mansfield and Camel's Hump; in New York only on the summit of Whiteface.

On the siliceous or granitic rocks of the Kittatinny Mts. in New Jersey, the Shawangunk and Catskill Mts. in New York, and exposed granitic ledges of Connecticut and southwestern Rhode Island occurs a plant which has always been referred to *A. groenlandica*. The writer had never had a field-acquaintance with this plant of southern

New England, southern New York and northern New Jersey, until the past June, when at the invitation of Mrs. Orra Parker Phelps, he visited with her an extensive area in Charlestown, Rhode Island, where she had found the *Arenaria* abundant in the dry *Cladonia* carpet on exposed granite ledges. At Charlestown the plant was passing out of flower and with much mature fruit. It had taller, more forking and more brittle stems than in the familiar alpine *A. groenlandica*, no tufted basal foliage, but the flowers and fruits were quite like those of *A. groenlandica*. The habitats at Charlestown, either exposed sunny ledges in the pastures where the plant mingled with *Krigia virginica*, *Hypericum gentianoides*, *Juncus secundus*, and other Carolinian plants, or crevices of ledges in the dry oak woods, were so far from boreal stations that it seemed highly improbable that this Rhode Island plant could be identical with the arctic-alpine *A. groenlandica*. Abundant material was collected and it proves to be identical with the plant from Middletown and North Guilford, Connecticut, and the specimens from the Catskills which have always passed as *A. groenlandica* and it is probable that the plants from the Shawangunk and Kittatinny Mts. (as well as from the mountains of Pennsylvania), which the writer has not seen, are the same; and in no point does this material from southern New England and southern New York differ from true *A. glabra* from North Carolina and Tennessee.

Furthermore, perfectly typical *A. glabra* occurs northward into New Hampshire and Maine; in New Hampshire found on the lower granite mountains with *Paronychia argyrocoma*, var. *albimontana* and other plants of austral affinity or occasionally on ledges in oak woods. It is on Welch Mt., a dry warm granitic mass south of the Franconia Range, and when Professor A. S. Pease found it in oak woods of Carroll Co., he was so impressed with the fact that this was not the proper habitat for *A. groenlandica* that he specially commented on "*A. groenlandica* (Retz.) Spreng., which is not uncommon on the mountains of the Montalban Range, but which is perhaps seldom found in so incongruous a situation as here, growing under the shade of red oak trees!"¹ In Maine *A. glabra* is found on the lesser granitic mountains (Streaked Mt., Oxford Co., Alamoosook, Hancock Co., Peaked Mt., Penobscot Co., etc.), and on ledges near the mouth of

¹ Pease, RHODORA, xvii, 233 (1915).

the Kennebec. Eastward, on Mt. Desert Island as well as at Halifax, Nova Scotia, the plant in stature and habit is perplexingly transitional to the boreal *A. groenlandica*, being usually more tufted and lower than in *A. glabra* but with the very bushy habit of the latter and with pedicels intermediate in length, and petals shorter than in most arctic-alpine plants. Similarly, on some of the secondary mountains of Maine and New Hampshire (White Cap, Rumford, Maine, Mt. Hope, Coös Co., New Hampshire, etc.) the plant is so transitional between the arctic-alpine and the Alleghenian plant that specimens might pass for either; while the plant from the summit of Roan Mt., North Carolina, has the habit of *A. groenlandica* but the longer leaves and slightly shorter petals of *A. glabra*.

In brief, there seem to be no absolute lines by which *A. groenlandica* and *A. glabra* can be distinguished, although the plants of arctic-alpine and those of Alleghenian range have certain tendencies of habit and foliage which in extreme colonies are well marked, though in transitional areas these tendencies break down. At best, then, *A. glabra* is a geographic variety of *A. groenlandica*. The characters and ranges of the two varieties are stated below.

A. GROENLANDICA (Retz.) Spreng. Syst. ii. 402 (1825). *Stellaria groenlandica* Retz. Fl. Scand. ed. 2, 107 (1795). *Alsine groenlandica* Gray, Man. ed. 2, 58 (1856). *Alsinopsis groenlandica* Small, Fl. S. E. U. S. 420, 1330 (1903).—Tufted, forming dense mats of short leafy basal shoots 1–13 cm. broad: stems few to very numerous, filiform, depressed, decumbent or suberect, simple to freely forking 2–10 (rarely –15) cm. high, 1–30-flowered: leaves linear, obtuse, soft, often flaccid, or the basal narrowly oblanceolate; the basal 3–15 mm. long; the uppermost cauline (below the first forking) 2–9 mm. long: pedicels erect or spreading becoming 0.6–2.3 cm. long: calyx 3–5 mm. long, campanulate; the ascending essentially nerveless oblong to oval scarious-margined sepals obtuse: petals broadly to narrowly obovate, usually retuse, white, 6–10 mm. long (sometimes smaller or wanting): capsule globose-ovoid to slender-conical, slightly exserted: seeds reddish-brown, 0.7–0.8 mm. long.—Greenland and Labrador, south to Table-top Mt., Gaspé Co., Quebec, the higher mountains of Maine, New Hampshire, Vermont and New York, and in uncharacteristic form to the coast of southern Nova Scotia and eastern Maine.

Var. *glabra* (Michx.), n. comb. *A. glabra* Michx. Fl. Bor.-Am. i. 274 (1803). *Alsine glabra* Gray, Man. ed. 2, 58 (1856). *Alsinopsis glabra* Small, Fl. S. E. U. S. 420, 1330 (1903).—Similar: less tufted, usually with few if any short leafy basal shoots: stems solitary-few,

erect or strongly ascending, simple to freely forking, 0.7–2.7 dm. high, 1–50-flowered; the uppermost cauline leaves (below the first forking) 0.8–3 cm. long; pedicels becoming 1.2–4.5 cm. long; calyx 3–5 mm. long; petals 4–8 mm. long.—Mountains of Georgia, Tennessee and North Carolina, locally north on exposed siliceous rocks to the Catskill Mts., New York, central Connecticut, southwestern Rhode Island, central New Hampshire, and central Maine.

VI. THE AMERICAN VARIATIONS OF *ARENARIA VERNA*.

In 1906¹ it was felt by the present writer that the variations of *Arenaria verna* with petals shorter than or barely equaling the calyx could be separated as three varieties: var. *propinqua* (Richardson) Fernald, a glandular-pubescent plant with the rather tall flowering branches (up to 1.5 dm.) 2–5-flowered, and with the fruiting calyx 2.5–3.5 mm. long; var. *hirta* (Wormskj.) Watson, similar but with fruiting calyx 4–5 mm. long; and var. *rubella* (Wahlenb.) Watson, glabrous or nearly so, with branches 1 (rarely 2)-flowered and with calyx 3–4 mm. long. Since that time the writer has collected the plants extensively in Labrador, Newfoundland and Quebec and material from other regions has been sent him for study. As a result of reconsidering his former attitude it may now be stated that these variations are so freely confluent as to be practically unrecognizable.² They should be merged as one North American variety which is also in boreal Eurasia, and the earliest varietal designation seems to have been that of Chamisso & Schlechtendal, in 1826, when they distinguished *Arenaria hirta* α . *glabra* (the same as *A. verna*, var. *propinqua*, forma *epilis* Fernald) and β . *pubescens* (which covers vars. *hirta* and *propinqua* of later authors). This variety should, then, be known as

ARENARIA VERNA L., var. ***pubescens*** (Cham. & Schl.), n. comb. *Ar. Gieseckii* Hornem. Fl. Dan. ix. t. 1518 (1816). *Ar. hirta* Wormskj. Fl. Dan. x. t. 1646 (1819) excl. syn. *Ar. propinqua* Richardson in Frankl. Journ. 738 — reprint 10 (1823). *Ar. hirta* β . *pubescens* Cham. & Schlecht. Linnaea i. 56 (1826). *Alsine hirta* (Wormskj.) Hartm. Handb. Skand. Fl. ed. 3, 104 (1838). *Als. verna*, η . *hirta*

¹ RHODORA, viii. 32 (1906).

² Fenzl well understood the situation when he spoke of *A. verna* with "varietatum limitibus difficillime coërcenda, synonymia taediosa ac inextricabili fere modo confusa, botanicorum omnis aevi cruciamentum." — Fenzl in Ledeb. Fl. Ross. i. 348 (1842).

(Wormskj.) Fenzl in Ledeb. Fl. Ross. i. 349 (1842). *Als. hirta*, *a. foliosa* Hartm. Handb. Skand. Fl. ed. 6, 149 (1854). *Ar. verna*, var. *hirta* (Wormskj.) Watson in King, Rep. 41 (1871). *Als. propinqua* (Richardson) Lange, Fl. Dan. xvii. 7, 8 (1877) as to Greenland plant. *Als. verna*, *δ. propinqua* (Richardson) Grönl. Isl. Fl. 33 (1881) as to name. *Als. rubella*, var. *hirta* (Wormskj.) Gürke, Pl. Eur. ii. 258 (1899). *Ar. verna cquicaulis* A. Nelson, Bull. Torr. Bot. Cl. xxvi. 352 (1899). *Ar. verna*, var. *propinqua* (Richardson) Fernald, RHODORA, viii. 32 (1906). *Alsinopsis propinqua* (Richardson) Rydberg, Bull. Torr. Bot. Cl. xxxiii. 140 (1906). *Alsinopsis hirta* (Wormskj.) Cockerell, Am. Nat. xl. 864 (1906).

A. VERNA, var. PUBESCENS, forma **epilis** (Fernald), n. comb. *Alsine rubella* Wahlenb. Fl. Lapp. 128, t. 6 (1812). *Alsinella rubella* (Wahlenb.) Swartz, Summa Veg. Scand. 17 (1814). *Ar. quadrivalvis* R. Br. in Parry, 1st Voy. App. 271 (1824). *Ar. hirta a. glabrata* Cham. & Schlecht. Linnaea, i. 56 (1826). *Ar. rubella* (Wahlenb.) Sm. Engl. Bot. Suppl. i. t. 2638 (1831). *Alsine verna*, *δ. glacialis* Fenzl in Ledeb. Fl. Ross. i. 350 (1842). *Alsine verna*, *β. rubella* (Wahlenb.) Hartm. Handb. Skand. Fl. ed. 6, 149 (1854). *Ar. verna*, var. *rubella* (Wahlenb.) Wats. Bibl. Ind. 99 (1878). *Ar. verna*, var. *propinqua*, forma *epilis* Fernald, RHODORA, viii. 32 (1906). *Alsinopsis quadrivalvis* (R. Br.) Rydberg, Bull. Torr. Bot. Cl. xxxiii. 140 (1906).

NARDUS STRICTA IN THE WHITE MOUNTAINS.

ANNIE LORENZ.

At Waterville, New Hampshire, the past season, the writer's attention was caught by a peculiar and unfamiliar tufted grass. It grew abundantly, perhaps a hundred tufts, on a dry, sterile bank below the Crawford cottage at the edge of the golf-links, and bore abundant spikes, which, however, were considerably past maturity.

With the aid of Britton & Brown's Flora it was found to be *Nardus stricta* L., a European grass, the only American localities cited in the work mentioned being Newfoundland and Amherst, Mass. (Tuckerman).

The species is indigenous in Greenland and eastern Newfoundland. In the Gray Herbarium are specimens from two stations in the United States. One is Tuckerman's original collection from Amherst, Massachusetts, and its label bears the following note: "has appeared in poor grassland (undisturbed 19 years) adjoining my garden. Amherst, 1871. E. T." The other is labelled: "Andover, New Hampshire, August 29, 1901. A. A. Briggs."

Batchelder's Flora of Manchester, New Hampshire, and Vicinity reports the species as very rare at Andover, New Hampshire. There is also a report of it from Gill, Massachusetts, in Stone's Flora of Franklin and Hampden Counties.

In Europe it has a fairly wide range throughout the western part of the continent and as far east as the Caucasus. Apparently it frequents the more hilly regions, not getting into the steppe country of Russia. It is reported as growing in the mountain pastures, heaths, moors and sterile places. In Switzerland and Italy it is found in the subalpine regions, through the Apennines, Corsica and Sardinia.

As Waterville is subalpine, and the golf-links have a sterile acid soil, forming a habitat much like that which it frequents in its European home, the colony may become permanently established here. It must have existed for a number of years, if one may judge by the size and vigor of the tufts, but it had been previously overlooked by the writer. This grass (wire-bent or mat-grass) is rather noticeable in appearance, growing in tufts with tough, closely matted culm-bases, fine wiry dark-green leaves a foot or more long, and curious secund spikes with a double row of single-flowered spikelets. The attention of collectors is called to it. Specimens have been deposited in the Gray Herbarium.

HARTFORD, CONNECTICUT.

A DISTINCTION BETWEEN TWO CARICES.— *Carex laxiculmis* Schweinitz and *C. digitalis* Willdenow are well-marked species of sedges which can, as a rule, be easily separated by any one of the half-dozen characters given in the manuals. These diagnostic features are all somewhat variable, however, so that occasional plants are puzzling and nearly connect the two species. The one recognized variety, *C. laxiculmis copulata*, was originally described by Prof. Bailey as *C. digitalis* var. *copulata*, and was treated as a variety of the latter species by Kükenthal in 1909. Any additional mark of distinction between these two species is therefore welcome, particularly if constant. Such a character seems to be found in the nature of the pistillate spikes. In both species there are normally from one to three minute scales at the tip of each pistillate spike; these are usually

empty but, in *C. digitalis*, at least, sometimes contain stamens. With this exception the female spikes of *C. digitalis* are strictly pistillate. In *C. laxiculmis*, however, at least one, usually a majority or all, of the pistillate spikes in each culm bear from one to three staminate flowers at the base.

Mr. K. K. Mackenzie has called my attention to Kükenthal's description of the latter species (under the name *Carex retrocurva* Dewey) in the Pflanzenreich. Here this peculiarity is noted in the following words but is not emphasized as a distinctive character: "Spiculæ laterales 3-4 ♀ (basi floribus paucis ♂ vel squamis sterilibus instructae)." As no mention of this character is made in Britton & Brown's Illustrated Flora, nor in Gray's Manual, it seems desirable to direct attention to it.—W. DEW. MILLER, Plainfield, New Jersey.

GALAX APHYLLA INTRODUCED IN MASSACHUSETTS.—In the fall of 1917 while walking through woods in the northeastern part of Swampscott, Massachusetts, the writer found two clusters of round-heart-shaped, crenate-toothed, long-petioled shining leaves. Some of the leaves were sent to the Gray Herbarium where they were identified as "*Galax aphylla* L., the foliage of which is extensively used by florists." *Galax aphylla* is not native north of Virginia and in reference to the Swampscott plants which have established themselves among oak trees on dryish upland, Mr. M. L. Fernald writes, "I know of no other record of its attempting to become naturalized in New England." Several investigations since finding the *Galax* show the plants in thrifty condition as regards leaves, but no sign of bud or blossom has been seen.—MARTHA E. WARD, Lynn, Massachusetts.

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